General

Guideline Title

The investigation and management of the small-for-gestational-age fetus.

Bibliographic Source(s)

Royal College of Obstetricians and Gynaecologists (RCOG). The investigation and management of the small-for-gestational-age fetus. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2013 Feb. 34 p. (Green-top guideline; no. 31). [197 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the original guideline document.

Classification of evidence levels (1++ to 4) and grades of recommendations (A-D) are defined at the end of the "Major Recommendations" field.

What Are the Risk Factors for a Small-or-Gestational-Age (SGA) Fetus/Neonate? What is the Optimum Method of Screening for the SGA Fetus/Neonate and Care of "At Risk" Pregnancies?

History

B - Women who have a major risk factor (Odds Ratio [OR] >2.0) should be referred for serial ultrasound measurement of fetal size and assessment of wellbeing with umbilical artery Doppler from 26–28 weeks of pregnancy (Appendix 1 of the original guideline document).

Biochemical Markers Used for Down Syndrome (DS) Screening

B - 2nd trimester DS markers have limited predictive accuracy for delivery of a SGA neonate.

Uterine Artery Doppler

A - In a low risk population uterine artery Doppler has limited accuracy to predict a SGA neonate and use in the 2nd trimester has shown no benefit to mother or baby. Use of uterine artery Doppler in this population is not justified.

A - In high risk populations uterine artery Doppler at 20–24 weeks of pregnancy has a moderate predictive value for a severely SGA neonate.

C - In women with an abnormal uterine artery Doppler at 20–24 weeks of pregnancy, subsequent normalisation of flow velocity indices is still associated with an increased risk of a SGA neonate. Repeating uterine artery Doppler is therefore of limited value.

Fetal Echogenic Bowel

C - Serial ultrasound measurement of fetal size and assessment of wellbeing with umbilical artery Doppler should be offered in cases of fetal echogenic bowel.

Clinical Examination

C - Abdominal palpation has limited accuracy for the prediction of a SGA neonate and thus should not be routinely performed in this context.

B - Serial measurement of symphysis fundal height (SFH) is recommended at each antenatal appointment from 24 weeks of pregnancy as this improves prediction of a SGA neonate.

What Is the Optimum Method of Diagnosing a SGA Fetus and Fetal Growth Restriction (FGR)?

A - Fetal abdominal circumference (AC) or estimated fetal weight (EFW) $<10^{th}$ centile can be used to diagnose a SGA fetus.

C - Use of a customised fetal weight reference may improve prediction of a SGA neonate and adverse perinatal outcome. In women having serial assessment of fetal size, use of a customised fetal weight reference may improve the prediction of normal perinatal outcome.

A - Routine measurement of fetal AC or EFW in the 3rd trimester does not reduce the risk of a SGA neonate nor does it improve perinatal outcome. Routine fetal biometry is thus not justified.

C - Change in AC or EFW may improve the prediction of wasting at birth (neonatal morphometric indicators) and adverse perinatal outcome suggestive of FGR.

C - When using two measurements of AC or EFW to estimate growth velocity, they should be at least 3 weeks apart to minimize false–positive rates for diagnosing FGR. More frequent measurements of fetal size may be appropriate where birth weight prediction is relevant outside of the context of diagnosing SGA/FGR.

What Investigations Are Indicated in SGA Fetuses?

C - Offer a referral for a detailed fetal anatomical survey and uterine artery Doppler by a fetal medicine specialist if severe SGA is identified at 18–20 week scan.

C - Karyotyping should be offered in severely SGA fetuses with structural anomalies and in those detected before 23 weeks of gestation, especially if uterine artery Doppler is normal.

C - Serological screening for congenital cytomegalovirus (CMV) and toxoplasmosis infection should be offered in severe SGA.

C - Uterine artery Doppler has limited accuracy to predict adverse outcome in SGA fetuses diagnosed during the 3rd trimester.

What Interventions Should Be Considered in the Prevention of SGA Fetuses/Neonates?

C - Antiplatelet agents may be effective in preventing SGA birth in women at high risk of preeclampsia although the effect size is small.

A - In women at high risk of preeclampsia antiplatelet agents should be commenced at or before 16 weeks of pregnancy.

A - There is no consistent evidence that dietary modification, progesterone or calcium prevent SGA birth. These interventions should not be used for this indication.

A - Interventions to promote smoking cessation may prevent SGA birth. The health benefits of smoking cessation indicate that these interventions should be offered to all women who are pregnant and smoke.

D - Antithrombotic therapy appears to be a promising therapy for preventing SGA birth in high risk women. However, there is insufficient evidence, especially concerning serious adverse effects, to recommend its use.

What Interventions Should Be Considered in the Preterm SGA Fetus?

C - Women with a SGA fetus between 24^{+0} and 35^{+6} weeks of gestation, where delivery is being considered, should receive a single course of antenatal corticosteroids.

What is the Optimal Method and Frequency of Fetal Surveillance in a SGA Infant and What Is/Are the Optimal Test/s to Time Delivery?

Umbilical Artery Doppler

A - In a high–risk population, the use of umbilical artery Doppler has been shown to reduce perinatal morbidity and mortality. Umbilical artery Doppler should be the primary surveillance tool in the SGA fetus.

B - When umbilical artery Doppler flow indices are normal it is reasonable to repeat surveillance every 14 days.

Cardiotocography (CTG)

A - CTG should not be used as the only form of surveillance in SGA fetuses.

A - Interpretation of the CTG should be based on short term fetal heart rate variation from computerised analysis.

Amniotic Fluid Volume

A - Interpretation of amniotic fluid volume should be based on single deepest vertical pocket.

Biophysical Profile (BPP)

A - BPP should not be used for fetal surveillance in preterm SGA fetuses.

Middle Cerebral Artery (MCA) Doppler

B - In the preterm SGA fetus, MCA Doppler has limited accuracy to predict acidaemia and adverse outcome and should not be used to time delivery.

C - In the term SGA fetus with normal umbilical artery Doppler, an abnormal middle cerebral artery Doppler (pulsatility index [PI] <5th centile) has moderate predictive value for acidosis at birth and should be used to time delivery.

Ductus Venosus (DV) and Umbilical Vein (UV) Doppler

A - DV Doppler has moderate predictive value for acidaemia and adverse outcome.

What Is the Optimal Gestation To Deliver the SGA Fetus?

C - If MCA Doppler is abnormal delivery should be recommended no later than 37 weeks of gestation.

A - In the SGA fetus detected after 32 weeks of gestation with normal umbilical artery Doppler, a senior obstetrician should be involved in determining the timing and mode of birth of these pregnancies. Delivery should be offered at 37 weeks of gestation.

How Should the SGA Fetus Be Delivered?

B - In the SGA fetus with normal umbilical artery Doppler or with abnormal umbilical artery PI but end–diastolic velocities present, induction of labour can be offered but rates of emergency caesarean section are increased and continuous fetal heart rate monitoring is recommended from the onset of uterine contractions.

Definitions:

Grades of Recommendations

A - At least one meta-analysis, systematic review or randomised controlled trial rated as 1++, and directly applicable to the target population; *or*

A systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B - A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 1++ or 1+

C - A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++

D - Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Classification of Evidence Levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias

1– Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

2++ High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ Well-conducted case–control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2– Case–control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytical studies, e.g., case reports, case series

4 Expert opinion

Clinical Algorithm(s)

The following clinical algorithms are provided in the original guideline document:

- Screening for Small–for–Gestational–Age (SGA) Fetus
- The Management of the SGA Fetus

Scope

Disease/Condition(s)

Small-for-gestational-age (SGA) fetus/neonate

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Risk Assessment

Screening

Treatment

Clinical Specialty

Obstetrics and Gynecology

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

- To guide clinicians, regarding the investigation and management of the small–for–gestational age (SGA) fetus
- To review the risk factors for a SGA fetus
- To provide recommendations regarding screening, diagnosis and management, including fetal monitoring and delivery

Target Population

- Unselected pregnant women in community settings
- High risk women (calculated on the basis of past obstetric history, current medical disorders or ultrasound diagnosis) in the hospital setting

Note: The guideline does not address multiple pregnancies or pregnancies with fetal abnormalities.

Interventions and Practices Considered

Assessment/Diagnosis

1. Risk assessment
2. Patient history
3. Clinical examination
4. Down's syndrome screening
5. Uterine artery Doppler
6. Umbilical artery Doppler
7. Symphysis fundal height (SFH) measurement
8. Fetal abdominal circumference (AC) or estimated fetal weight (EFW)
9. Karyotyping
10. Serological screening for congenital cytomegalovirus (CMV) and toxoplasmosis infection

Prevention

1. Antiplatelet agents
2. Smoking cessation

Management

1. Referral for a detailed fetal anatomical survey and uterine artery Doppler
2. Cardiotocography
3. Assessment of amniotic fluid volume
4. Middle cerebral artery (MCA) Doppler
5. Ductus venosus (DV) and umbilical vein (UV) Doppler
6. Determination of optimum gestation for delivery
7. Delivery method (induction of labour, caesarean section)

Major Outcomes Considered

- Birth weight
- Perinatal morbidity and mortality
- Incidence of referral to a higher level or special care unit

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Medline, PubMed, all EBM reviews (the Cochrane Register of Controlled Trials, Cochrane database of Systematic Reviews, methodology register, ACP journal club, DARE HTA, Maternity and Infant Care), EMBASE and TRIP were searched for relevant randomised controlled trials (RCTs), systematic reviews, meta–analyses and cohort studies. The search was restricted to articles published between 2002 and September 2011. Search words included 'fetal growth retardation', 'fetal growth restriction', 'infant, small for gestational age', including all relevant Medical Subject Heading (MeSH) terms. The search was limited to humans and the English language.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Classification of Evidence Levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias

1– Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

2++ High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ Well-conducted case–control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2– Case–control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytical studies, e.g., case reports, case series

4 Expert opinion

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Reviewing and Grading of Evidence

Once the evidence has been collated for each clinical question it needs to be appraised and reviewed (refer to section 3 in "Development of Royal College of Obstetricians and Gynaecologists [RCOG] Green-top guidelines: producing a clinical practice guideline" for information on the formulation of the clinical questions; see the "Availability of Companion Documents" field). For each question, the study type with least chance of bias should be used. If available, randomised controlled trials (RCTs) of suitable size and quality should be used in preference to observational data. This may vary depending on the outcome being examined.

The level of evidence and the grade of the recommendations used in this guideline originate from the guidance by the Scottish Intercollegiate Guidelines Network (SIGN) Grading Review Group, which incorporates formal assessment of the methodological quality, quantity, consistency, and applicability of the evidence base. The methods used to appraise individual study types are available from the SIGN Web site (www.sign.ac.uk/methodology/checklists.html). An objective appraisal of study quality is essential, but paired reviewing by guideline leads may be impractical because of resource constraints.

Once evidence has been collated and appraised, it can be graded. A judgement on the quality of the evidence will be necessary using the grading system (see the "Rating Scheme for the Strength of the Evidence" field). Where evidence is felt to warrant 'down-grading', for whatever reason, the rationale must be stated. Evidence judged to be of poor quality can be excluded. Any study with a high chance of bias (either 1– or 2–) will be excluded from the guideline and recommendations will not be based on this evidence. This prevents recommendations being based on poor-quality RCTs when higher-quality observational evidence is available.

Methods Used to Formulate the Recommendations

Expert Consensus

Informal Consensus

Description of Methods Used to Formulate the Recommendations

Guideline Development

The development of guidelines involves more than the collation and reviewing of evidence. Even with high-quality data from systematic reviews of randomised controlled trials, a value judgement is needed when comparing one therapy with another. This will therefore introduce the need for consensus.

Royal College of Obstetricians and Gynaecologists (RCOG) Green-top guidelines are drafted by nominated developers, in contrast to other guideline groups such as the National Institute for Health and Clinical Excellence (NICE) and the Scottish Intercollegiate Guidelines Network (SIGN), who use larger guideline development groups. Equally, in contrast to other guideline groups, the topics chosen for development as Green-top guidelines are concise enough to allow development by a smaller group of individuals.

In agreeing the precise wording of evidence-based guideline recommendations and in developing consensus-based 'good practice points', the Guidelines Committee (GC) will employ an informal consensus approach through group discussion. In line with current methodologies, the entire development process will follow strict guidance and be both transparent and robust. The RCOG acknowledges that formal consensus methods have been described, but these require further evaluation in the context of clinical guideline development. It is envisaged that this will not detract from the rigor of the process but prevent undue delays in development.

Rating Scheme for the Strength of the Recommendations

Grades of Recommendations

A - At least one meta-analysis, systematic review or randomised controlled trial rated as 1++, and directly applicable to the target population; *or*

A systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B - A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 1++ or 1+

C - A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++

D - Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Good Practice Point - Recommended best practice based on the clinical experience of the guideline development group

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Following discussion in the Guidelines Committee (GC), each Green-top guideline is formally peer reviewed. At the same time, the draft guideline is published on the Royal College of Obstetricians and Gynaecologists (RCOG) Web site for further peer discussion before final publication.

All comments will be collated by the RCOG and tabulated for consideration by the guideline leads. Each comment will require discussion. Where comments are rejected then justification will need to be made. Following this review, the document will be updated and the GC will then review the revised draft and the table of comments.

Once the GC signs-off on the guideline, it is submitted to the Standards Board for approval before final publication.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate diagnosis and management of small-for-gestational-age (SGA) fetuses/neonates leading to improved perinatal health outcomes and decreased perinatal morbidity and mortality

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

- These recommendations are not intended to dictate an exclusive course of management or treatment. They must be evaluated with reference to individual patient needs, resources and limitations unique to the institution and variations in local populations. It is hoped that this process of local ownership will help to incorporate these guidelines into routine practice. Attention is drawn to areas of clinical uncertainty where further research might be indicated.
- The Royal College of Obstetricians and Gynaecologists (RCOG) produces guidelines as an educational aid to good clinical practice. They present recognised methods and techniques of clinical practice, based on published evidence, for consideration by obstetricians and gynaecologists and other relevant health professionals. The ultimate judgement regarding a particular clinical procedure or treatment plan must be made by the doctor or other attendant in the light of clinical data presented by the patient and the diagnostic and treatment options available within the appropriate health services. This means that RCOG Guidelines are unlike protocols or guidelines issued by employers, as they are not intended to be prescriptive directions defining a single course of management. Departure from the local prescriptive protocols or guidelines should be fully documented in the patient's case notes at the time the relevant decision is taken.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Royal College of Obstetricians and Gynaecologists (RCOG). The investigation and management of the small-for-gestational-age fetus. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2013 Feb. 34 p. (Green-top guideline; no. 31). [197 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013 Feb

Guideline Developer(s)

Royal College of Obstetricians and Gynaecologists - Medical Specialty Society

Source(s) of Funding

Royal College of Obstetricians and Gynaecologists

Guideline Committee

Guidelines Committee

Composition of Group That Authored the Guideline

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Committee Lead Reviewers: Dr P Owen FRCOG, Glasgow, Scotland; Ms CJ Elson FRCOG, Leicestershire; Mr DJ Cruickshank FRCOG, Middlesborough

Peer Reviewers: British Maternal and Fetal Medicine Society (BMFMS); British Medical Ultrasound Society (BMUS); British Society of Urogenital Radiology (BSUR); Clinical Studies Group for Stillbirth (CSGS, hosted by SANDS); International Society of Ultrasound in Obstetrics and Gynaecologist (ISUOG); Perinatal Institute; Dr UB Agarwal MRCOG, Liverpool; Professor JC Dornan FRCOG, County Down, Northern Ireland; Dr MA Harper FRCOG, Belfast; Mr B Kumar FRCOG, Wrexham; Dr AC McKelvey MRCOG, Norfolk; Professor LME McCowan, University of Auckland, New Zealand; Mr DJ Tuffnell FRCOG, Bradford; Mr SA Walkinshaw FRCOG, Liverpool

Financial Disclosures/Conflicts of Interest

Conflicts of interest: None declared.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Royal College of Obstetricians and Gynaecologists (RCOG) Web site .

Availability of Companion Documents

The following are available:

- Development of RCOG Green-top guidelines: policies and processes. Clinical Governance Advice No 1a. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2006 Nov. 6 p. Electronic copies: Available from the Royal College of Obstetricians and Gynaecologists (RCOG) Web site .
- Development of RCOG Green-top guidelines: producing a scope. Clinical Governance Advice No 1b. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2006 Nov. 4 p. Electronic copies: Available from the RCOG Web site .
- Development of RCOG Green-top guidelines: producing a clinical practice guideline. Clinical Governance Advice No 1c. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2006 Nov. 13 p. Electronic copies: Available from the RCOG Web site .
- Development of RCOG Green-top guidelines: consensus methods for adaptation of Green-top guidelines. Clinical Governance Advice No 1d. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2010 Feb. 9 p. Electronic copies: Available from the RCOG Web site .

In addition, suggested audit topics can be found in section 13 of the original guideline document .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on May 20, 2013. The information was verified by the guideline developer on June 11, 2013.

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